Table 2-H-4a
Bay Area to Merced – High-Speed Train Alignment Evaluation Matrix
San Francisco to San Jose Segment

Alignment = Alignment Carried Forward **Alignment** = Alignment Eliminated = Primary/Secondary Reason for Elimination

Objective	Alignments				
	U.S. 101 (Exclusive Guideway)		Caltrain (Exclusive Guideway)		Caltrain (Shared Use)
	Transbay Terminal Station	4th & King Terminal Station	Transbay Terminal Station	4th & King Terminal Station	Four-Track
Maximize Ridership/Revenue Potential					
Travel Time	5	5	5	5	4
Express	31 min.	30 min.	30 min.	28 min.	35 min.
Local	39 min.	37 min.	37 min.	36 min.	41 min.
Length	5	5	5	5	5
	48.4 mi. (77.9 Km.)	47.2 mi. (76.0 Km.)	48.2 mi. (77.6 Km.)	47.0 mi. (75.7 Km.)	48.0 mi. (77.3 Km)
Minimize Operating and Capital Costs.					
Length	5	5	5	5	5
	48.4 mi. (77.9Km.)	47.2 mi. (76.0 Km.)	48.2 mi. (77.6 Km.)	47.0 mi. (75.7 Km.)	48.0 mi. (77.3 Km)
Operational Issues	5	5	5	5	4
	• Some speed restrictions due to curves.	• Some speed restrictions due to curves.	• Some speed restrictions due to curves.	• Some speed restrictions due to curves.	• Track capacity constraints due to shared use • Need to optimize commuter & high-speed train schedules
Construction Issues	1	2	1	2	4
	• Construction adjacent to major freeway. • Stage construction, detours, nighttime work required. • Soft-ground tunneling to reach Transbay Terminal.	• Construction adjacent to major freeway. • Staged construction, detours, nighttime work required. • Terminal on aerial structure above active Caltrain yard & station.	• Construction adjacent to & above active railroad. • Staged construction, detours, nighttime work required. • Soft-ground tunneling to reach Transbay Terminal	• Construction adjacent to & above active railroad. • Staged construction, detours, nighttime work required. • Terminal on aerial structure above active Caltrain yard & station	• Construction of grade separations will require staged construction, shoo-flys, detours, & nighttime work. • Additional aerial structures adjacent to & above active railroad will require staged construction, detours, & nighttime work.

Objective	Alignments				
	U.S. 101 (Exclusive Guideway)		Caltrain (Exclusive Guideway)		Caltrain (Shared Use)
	Transbay Terminal Station	4th & King Terminal Station	Transbay Terminal Station	4th & King Terminal Station	Four-Track
Capital Cost	1 • Highest cost • Aerial structure • Major ROW costs		2 • High cost • $300 Million less than U.S. 101 • Aerial structure • Major ROW costs		3 • Low cost • Approx. 400 Mil. less than U.S. 101 Exclusive Guideway • Uses existing infrastructure • Assumes ½ cost of Caltrain Electrification & ½ cost of Caltrain San Francisco Downtown Extension
Right-of-Way Issues/Cost	1 • Mostly commercial and industrial. • Major ROW costs		2 • Mostly commercial & residential. • Less ROW costs	2	4 • Commercial, residential & industrial properties adjacent to railroad at roads to be grade separated. • Bypass tracks take additional ROW
Land Use Compatibility and Conflicts	2 • Generally commercial with numerous segments residential (typically behind sound walls) • Arial portion could be incompatible with residential development		1 • Generally industrial with numerous segments of residential • Passes through multiple suburban town centers • Arial portion could be incompatible with residential development		4 • Generally industrial with numerous segments of residential • Passes through multiple suburban town centers • Critical land use & design issues associated with grade separations
Visual Quality Impacts	1 • Major New Visual Element – impacts on residential developments along freeway and Caltrain corridor				3 • Impacts from grade separations – sensitive design critical
Water Resources	1	1	4	4	4
# of crossings of alignment (linear ft of alignment centerline)	27 (1,350)	27 (1,350)	19 (950)	19 (950)	19 (950)
Floodplain Impacts	4	4	4	4	4
# of 100 yr. floodplain crossings	31	31	25	25	25
Length of alignment within 100 yr. floodplain	12,331	12,331	14,048	14,048	14,048
Percent of total length within floodplain	18.1%	18.1%	20.1%	20.1%	20.1%

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Threatened & Endangered Species Impacts	2	2	4	4	4
# of threatened & endangered species (per CNDDB)	9	9	4	4	4
# Federal endangered	7	7	3	3	3
# Federal threatened	2	2	1	1	1
# State endangered	3	3	2	2	2
# State threatened	0	0	0	0	0
Area of alignment within sensitive habitat (per CNDDB)	526,911	526,911	383,674	383,674	383,674
Environmental Justice Impacts (Demographics)	4	4	4	4	4
# block groups >50 percent Minority	66	66	56	56	56
# block groups >50 percent low-income	1	1	1	1	1
Potentially affected minority population	20,735	20,735	18,716	18,716	18,716
Potentially affected low-income population	2	2	2	2	2
Farmland Impacts	No farmland impacts				
Cultural Resources Impacts	5		1		4
# of known resources within ROW	• 3 historic resources		• Adverse effects on 6 historic train stations: Santa Clara, Palo Alto, Menlo Park, San Carlos, Burlingame, & Millbrae.		• Possible adverse effects on Santa Clara, Menlo Park, & Burlingame historic stations from single-track bypass structures – depending on design & location of bypass
Parks & Recreation/ Wildlife Refuge Impacts	3		4		
	• Passes through or adjacent to 12 parks • Need to evaluate avoidance & mitigation alternatives		• Passes through El Palo Alto Park • Need to evaluate avoidance & mitigation alternatives		
Wetlands (sites/area)	(12/2.2 ac)	(12/2.2 ac)	(7/0.6 ac)	(7/0.6 ac)	(7/0.6 ac)

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Soils/Slope Constraints	5	5	4	4	4
Area of highly erodible soils (square meters)	595,835	595,835	955,283	955,283	955,283
Area of high shrink/ swell soils (square meters)	830,006	830,006	989,454	989,454	989,454
Area of steep slopes - greater the 9 percent (square meters)	0%	0%	0%	0%	0%
Seismic Constraints	• San Bruno Fault • All high-speed train facilities would be designed taking into account existing soil, groundwater, and geologic conditions in the area and to withstand maximum credible earthquakes from fault activity in the area.				

1 2 3 4 5
Least Favorable **Most Favorable**